



# New records for the Peruvian high-altitude diving beetle *Rhantus blancasi* Guignot, 1955 (Coleoptera, Dytiscidae, Colymbetinae)

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## Abstract

The diving beetle *Rhantus blancasi* Guignot, 1955 (Coleoptera, Dytiscidae, Colymbetinae) was until now only known from older reports from Pasco region, Peru. Here, we provide new distributional data from Cuzco and Junin regions, habitat information, and illustrations of diagnostic characters for the easy identification of the species.

## Keywords

Aquatic Coleoptera, high-altitude lakes, South America, taxonomy.

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## Introduction

Diving beetles (Coleoptera, Dytiscidae) are a comparably well-known group of beetles. There are about 4,500 known species (Nilsson and Hajek 2019), occupying a large variety of aquatic habitats including ground water, rivers and streams, peat bogs, hypersaline as well as hygropetric habitats, ponds, puddles, and lakes. They can easily be collected, and are often used as a study group for ecological, conservation, and biogeographic and evolutionary research (Balke and Hendrich 2016; Miller and Bergsten 2016). Diving beetles are also abundant predators in lentic tropical alpine ecosystems, reaching altitudes up to 5,100 m in the Himalayas (Branucci and Hendrich 2006). One major global group of tropical alpine diving beetles belongs to the genus *Rhantus* Dejean, 1833 (subfamily Colymbetinae). There are 93 species in the world (Nilsson and Hajek 2019; Balke et al. 2019, in press). Their evolution and biogeographic

history was studied based on a comprehensively sampled molecular phylogeny, and so was the evolution of enigmatic Neotropical lineages (Morinière et al. 2015, 2016). This work also led to a reclassification of species formerly included in *Rhantus* (Balke et al. 2017). The Neotropical high-altitude fauna was inferred as originating from cold-adapted colonisers from the Holarctic. However, biogeographic patterns within the Andes remain little known. For that reason, more effort has to be directed to the study of Andean high-altitude ecosystems, which are threatened by intensifying land use, mining, and possibly global warming. In the context of such work, we have discovered new localities for the Peruvian high-altitude diving beetle *Rhantus blancasi* Guignot, which was described in 1955 and only known from the type material. These are presented here, and, for the first time, photographs of the species' habitat and morphological characters.



## Methods

This work was authorized by SERFOR (Servicio Nacional Forestal y de Fauna Silvestre del Ministerio de Agricultura y Riego). The beetles were studied with a Leica M205C stereo microscope at 10–160 $\times$ . Habitus images were taken with a Canon EOS 5DS camera fitted with the Canon MPE65 macro lens, attached to a Stackmaster macro rail (Stonemaster: <https://www.stonemaster-onlineshop.de/>). For photographs of genitalia and the claws we used a 10 $\times$  Mitutoyo ELWD Plan Apo objective attached to a Carl Zeiss Jena Sonnar 3.5, 135 MC as focus lens. Illumination was with three to four LED segments SN-1 from Stonemaster. Image stacks were generated using the Stackmaster macro rail, and images were then assembled with the computer software Helicon Focus 4.77. The map was created with primap MapCreator 3.0, Professional Edition.

Voucher specimens are stored in Natural History Museum of San Marcos University, Lima, Peru (MUSM) as well as SNSB-Zoologische Staatssammlung, München, Germany (ZSM).

## Results

### *Rhantus blancasi* Guignot, 1955

*Rhantus blancasi* Guignot 1955: 10 (original description); Balke 1992: 31 (redescription); Nilsson and Hájek 2019: 42 (catalogue).

**Type locality and type collecting data.** Peru, Pasco Region, Pasco Province, Cerro de Pasco, Naticocha Lagoon, near Huarón (taken from GoogleEarth:  $-11.032^{\circ}$ ,  $-76.452^{\circ}$ ), 4,600 m, July 1949, collector: Fortunato Blancas Sánchez.

**New records.** PERU • 2 individuals; Junin Region, Jauja Province, Jauja, Tragadero Lagoon,  $-11.767^{\circ}$ ,  $-75.532^{\circ}$ ; 3,460 m, 04 Aug. 2018, Y.S. Megna & N. Zenteno, PER\_YM\_2018\_03, DNA barcoding vouchers MB 8073 and 8074 • 5 individuals, Cuzco Region, Canchis Province, Canchis, Checacupe, Cayena,  $-13.981^{\circ}$ ,  $-71.068^{\circ}$ , 4,850 m, 25 Aug. 2018, Y.S. Megna & N. Zenteno, PER\_YM\_2018\_27, DNA barcoding vouchers MB 8213 to 8217.

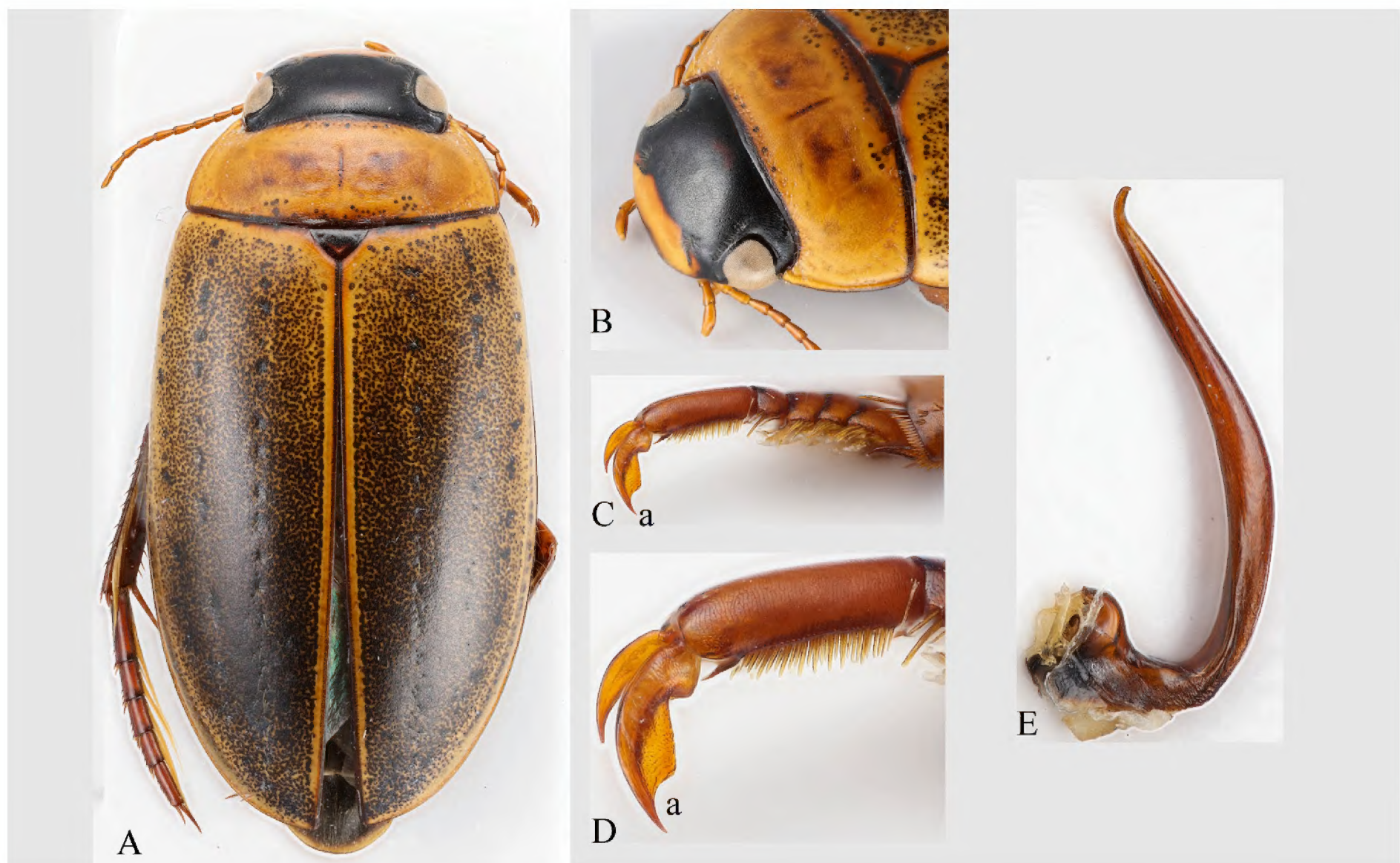
This species was collected from the margin of permanent lakes, with muddy bottom and with abundant aquatic vegetation (Fig. 1). It was associated with other dytiscid species, *Liodesus* sp., *Lancetes* sp., and *Rhantus* sp. (we did not further identify these pending revisionary taxonomic work), as well as the hydrophilid *Tropisternus* sp.

**Identification.** The species was identified based on previous study of the holotype (in the Muséum National d'Histoire Naturelle Paris: Balke 1992). There is a second specimen in MUSM with the same label data as the holotype, and with a typewriter written label "Rhantus



**Figure 1.** *Rhantus blancasi*. Habitat, above the locality Junin Region, Jauja Province, Tragadero Lagoon, below Canchis, Checacupe, Cayena.





**Figure 2.** *Rhantus blancasi*. **A.** Habitus dorsal, length of beetle 10.5 mm. **B.** Head and pronotum, frontal-lateral view. **C.** Protarsus male (a = anterior claw). **D.** Male protarsomere V and protarsal claws in detail. **E.** Median lobe of aedeagus in lateral view.

*Blancasi* n.sp.” and a handwritten label with inventory number “MHN 4203”. This specimen is obviously from the same collecting event as the holotype, but was not mentioned by Guignot (1955) in his original description of the species.

*Rhantus blancasi* belongs to the *Rhantus crypticus* group, with the other species being *R. vicinus* (Aubé, 1838) from Colombia and *R. crypticus* Balke, 1992 from Ecuador and Colombia (see Balke et al. 2019b for color images of taxonomically relevant characters). *Rhantus blancasi* can easily be separated from all other 93 *Rhantus* species in the world by the following combination of characters (Fig. 2A–E): pronotum mostly yellow; head black except for yellow clypeal region and dark orange frontal spot; fore claws of male of unique shape, anterior claw with large “tooth” and posterior claw much shorter and evenly curved; median lobe of aedeagus with conspicuous ventrally bent apical “hook” in lateral view.

## Discussion

*Rhantus blancasi* was described from Pasco Region. We present new records for Cuzco and Junin regions (Fig. 3). Interestingly, the species was not mentioned in the checklist of aquatic beetles from Cuzco by Bustamante (2018). The new locality in Junin region is c. 130 km from the type locality, and the new locality in Cuzco Region c. 670 km, so that this species can now be said to have a wider range across the Peruvian Andes. Future fieldwork will be needed to discover if *R. blancasi* is indeed endemic in Peru, or possibly also occurs in neighboring Bolivia.



**Figure 3.** *Rhantus blancasi*. Distribution across Peru, **1.** Type locality, Pasco, Natichocha Lagoon. **2.** Junin Region, Jauja Province Tragadero Lagoon. **3.** Canchis, Checacupe, Cayena. Map created with primap MapCreator 3.0, Professional Edition.



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## Authors' Contributions

MB and LH identified the species and wrote the manuscript. NZ and YSM organized fieldwork and collected the specimens. NZ studied the historical specimen in the MUSM collection. YSM, LF, NZ, and MB coordinated the research and revised the manuscript. All authors corrected, revised, and discussed the data.

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